

## ABSTRACT OF THE INVENTION

The present provides a carrier molecule for transporting a polyanionic macromolecule such as a nucleic acid across a biological barrier of a cell. The carrier has a biocompatible backbone polymer with two or more polycationic polymer fragments covalently linked. In one embodiment, the backbone polymer is polyethylene glycol (PEG) and the polycationic polymer is polyethylenimine (PEI). The copolymer carrier molecule can be complexed with a polyanionic macromolecule such as a nucleic acid (NA). The NA/copolymer complex is stable in biological conditions by forming a special coreshell-like micelle structure. The nucleic acid can be rapidly released from the complex when biodegradation linker are used to bind the polycationic polymer fragments to the polymer backbone. The carriers and complexes of the invention can be used in methods of delivering the polycationic macromolecules to cells both *in vitro* and *in vivo*.

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